6712-01

FEDERAL COMMUNICATIONS COMMISSION

47 CFR Parts 2 and 90

[WP Docket No. 07-100; PS Docket No. 06-229; WT Docket No. 06-150; FCC 12-61]

4.9 GHz Band

AGENCY: Federal Communications Commission.

ACTION: Proposed rule.

SUMMARY: The Commission allocated the 4940-4990 MHz (4.9 GHz) band in 2002 for fixed and mobile use and dedicated the band for public safety broadband communications. In the ten years since, the band has gone underutilized. The purpose of these proposed rules is to invigorate and maximize use of the 4.9 GHz band and attract more users while improving spectrum efficiency. The Commission seeks comment on formal coordination requirements, expanded eligibility, how the band can complement the 700 MHz public safety broadband network, technical rule changes, aeronautical mobile operations, interoperability standards, and deployment reporting.

DATES: Submit comments on or before **[INSERT DATE 60 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER]**. Submit reply comments **[INSERT DATE 90 DAYS AFTER PUBLICATION IN THE FEDERAL REGISTER]**.

ADDRESSES: You may submit comments, identified by WP Docket No. 07-100, PS Docket No. 06-229, WT Docket No. 06-150, by any of the following methods:

- Federal eRulemaking Portal: http://www.regulations.gov. Follow the instructions for submitting comments.

- Federal Communications Commission's Web Site: http://fjallfoss.fcc.gov/ecfs2/. Follow the instructions for submitting comments.
- Mail: U.S. Postal Service first-class, Express, and Priority mail must be addressed to 445 12th Street, SW, Washington DC 20554. Commercial overnight mail (other than U.S. Postal Service Express Mail and Priority Mail) must be sent to 9300 East Hampton Drive, Capitol Heights, MD 20743.
- Hand or Messenger Delivery: 445 12th St., SW, Room TW-A325, Washington, DC 20554.
- People with Disabilities: Contact the FCC to request reasonable accommodations (accessible format documents, sign language interpreters, CART, etc.) by e-mail: FCC504@fcc.gov or phone: 202-418-0530 or TTY: 202-418-0432.

For detailed instructions for submitting comments, additional information on the rulemaking process, and where to find materials available for inspection, see the SUPPLEMENTARY INFORMATION section of this document.

FOR FURTHER INFORMATION CONTACT: Thomas Eng, Policy and Licensing Division, Public Safety and Homeland Security Bureau, Federal Communications Commission, 445 12th Street, SW., Washington, DC 20554, at (202) 418-0019, TTY (202) 418-7233, or via e-mail at Thomas.Eng@fcc.gov.

SUPPLEMENTARY INFORMATION: This is a summary of the Commission's Fifth Further Notice of Proposed Rulemaking in WP Docket No. 07-100; PS Docket No. 06-229; WT Docket No. 06-150; adopted and released on June 13, 2012. The complete text of this document is available for inspection and copying during normal business hours in the FCC Reference Information Center, Portals II, 445 12th Street, SW, Room CY-A257, Washington, DC 20554.

This document may also be purchased from the Commission's duplicating contractor, Best Copy and Printing, Inc., in person at 445 12th Street, SW, Room CY-B402, Washington, DC 20554, via telephone at (202) 488-5300, via facsimile at (202) 488-5563, or via email at FCC@BCPIWEB.com. Alternative formats (computer diskette, large print, audio cassette, and Braille) are available to persons with disabilities or by sending an e-mail to FCC504@fcc.gov or calling the Consumer and Governmental Affairs Bureau at (202) 418-0530, TTY (202) 418-0432. This document is also available on the Commission's Web site at http://www.fcc.gov.

Comments

Pursuant to §§ 1.415 and 1.419 of the Commission's rules, 47 CFR 1.415, 1.419, interested parties may file comments and reply comments. Comments may be filed using: (1) the Commission's Electronic Comment Filing System (ECFS), (2) the Federal Government's eRulemaking Portal, or (3) by filing paper copies. See Electronic Filing of Documents in Rulemaking Proceedings, 63 FR 24121, May 1 (1998).

- Electronic Filers: Comments may be filed electronically using the Internet by accessing the ECFS: http://fjallfoss.fcc.gov/ecfs2/ or the Federal eRulemaking Portal: http://www.regulations.gov.
- Paper Filers: Parties who choose to file by paper must file an original and four copies of each filing. If more than one docket or rulemaking number appears in the caption of this proceeding, filers must submit two additional copies for each additional docket or rulemaking number.
    - Filings can be sent by hand or messenger delivery, by commercial overnight courier, or by first-class or overnight U.S. Postal Service mail. All filings must be

addressed to the Commission's Secretary, Office of the Secretary, Federal Communications Commission.

- All hand-delivered or messenger-delivered paper filings for the Commission's Secretary must be delivered to FCC Headquarters at 445 12th St., SW, Room TW-A325, Washington, DC 20554. The filing hours are 8:00 a.m. to 7:00 p.m. All hand deliveries must be held together with rubber bands or fasteners. Any envelopes must be disposed of before entering the building.
- Commercial overnight mail (other than U.S. Postal Service Express Mail and Priority Mail) must be sent to 9300 East Hampton Drive, Capitol Heights, MD 20743.
- U.S. Postal Service first-class, Express, and Priority mail must be addressed to 445 12th Street, SW, Washington DC 20554.

INTRODUCTION AND BACKGROUND

In this Fifth Further Notice of Proposed Rulemaking (Fifth Further Notice), we seek comment on specific proposals designed to establish appropriate frequency coordination procedures for public safety operations in the 4940-4990 MHz (4.9 GHz) and to encourage improved spectrum efficiency and greater use of the 4.9 GHz band. These steps are part of our continuing effort to provide clear and concise rules that facilitate and promote the deployment of new wireless technologies, devices and services. In addition, given directives in the Middle Class Tax Relief and Job Creation Act of 2012 ("Spectrum Act") to develop a nationwide interoperable public safety broadband network, we invite comment on how the 4.9 GHz band can best be used to complement this network.

In April 2009, the Commission released the Report and Order and Further Notice of Proposed Rulemaking (Report and Order and Further Notice, respectively) to "encourag[e] public safety users to more fully utilize the 4.9 GHz band" for broadband communications. In the Further Notice, the Commission proposed, among other things, to require that applicants for 4.9 GHz primary permanent fixed stations complete the formalized licensee-to-licensee coordination process established in part 101 for fixed microwave stations.

The Commission received five comments and two reply comments in response to the Further Notice. The commenters raised questions about the proposed licensee-to-licensee coordination process, for which a majority of commenters proposed database and registration approaches as alternatives. In order to permit further comment on proposals for coordination, we further explore 4.9 GHz coordination in the Fifth Further Notice. The Fifth Further Notice also seeks additional comment on the information we received at the February 25, 2011, 4.9 GHz Workshop hosted by the Commission on several issues, including not only coordination but also eligibility, licensing, band plan, power and antenna gain, aeronautical mobile use, and standards.

We also seek further comment on how public safety use of the 4.9 GHz band can best promote the long-established goal of establishing a nationwide public safety broadband network operating in the 700 MHz band. As we observed in the Fourth Further Notice of Proposed Rulemaking (Fourth FNPRM) in this proceeding, while the 700 MHz band contemplated for this network is allocated for mobile use, public safety broadband networks also have a critical need for fixed uses, such as for surveillance and backhaul capacity, and that public safety entities are currently using the 4.9 GHz band for such uses. Accordingly, the Commission sought comment on several 4.9 GHz issues, including how 4.9 GHz band networks could complement 700 MHz public safety broadband networks.

The Spectrum Act, enacted on February 22, 2012, has provided the road map for deployment of the nationwide interoperable public safety broadband network contemplated by the Commission in the Fourth FNPRM. Section 6101 of the Spectrum Act directs the Commission to reallocate the 700 MHz "D Block" (758-763 MHz/788-793 MHz) for public safety services. Section 6201 of the Act requires the Commission to assign a license for both the D Block and the existing public safety broadband spectrum (763-769 MHz/793-799 MHz) to the First Responder Network Authority (FirstNet), an independent authority within the National Telecommunications and Information Administration (NTIA). The Spectrum Act also establishes a Public Safety Trust Fund, with $7 billion available for buildout of the new network. The Fifth Further Notice seeks comment about how the new statutory framework for the public safety broadband network should affect public safety operations in the 4.9 GHz band, and whether FirstNet is or should be eligible for a 4.9 GHz band license.

FIFTH FURTHER NOTICE OF PROPOSED RULEMAKING

In 2002, when the Commission allocated the 4.9 GHz band for fixed and mobile services in support of public safety, it envisioned that the band would support new broadband applications such as high-speed digital technologies and wireless local area networks (WLANs) for incident scene management, dispatch operations, and vehicular/personal communications. This allocation responded to new national priorities focusing on homeland security, and was designed "to transition to an environment in which the public safety community enjoys maximum access to emerging broadband technologies." The Commission's allocation gained extensive support by first responders, the National Public Safety Telecommunications Council (NPSTC), and others asserting that the public safety community was in great need of additional

spectrum to meet their critical operations needs, and that the 4.9 GHz band was ideal for these emerging broadband technologies.

Notwithstanding the Commission's action to accord primary status to broadband permanent fixed point-to-point links in 2009, we believe that the development of the 4.9 GHz band, to date, has fallen short of its potential. There are approximately 2,440 licenses in the 4.9 GHz band. We estimate that fewer than 2,442 governmental entities hold these licenses because certain entities may have multiple licenses. By contrast, Census Bureau data for 2007 indicate that there were 89,476 local governmental jurisdictions in the United States, all of which are eligible to hold licenses in the 4.9 GHz band. We therefore take this opportunity to reevaluate our existing policies and to consider new approaches to spur robust and efficient use in this band. Toward that end, we seek comment on a number of important issues. First, we solicit views on the alternative frequency coordination proposals for 4.9 GHz licensees advanced in response to our Further Notice. Second, we seek comment on how 4.9 GHz licensees currently use this spectrum, how we might obtain more information about such uses, what applications and uses are best suited for the band, and what are the most cost-effective ways to improve accessibility to the band while minimizing the adverse impact on incumbent operations. We seek comment on specific proposals regarding expanded eligibility and alternative licensing approaches. Next, we seek comment about the impact of the newly enacted Spectrum Act on broadband uses of the 4.9 GHz band by public safety entities. We also seek comment on adjustments to the existing channel plan for this band and other technical changes designed to promote more efficient use of the spectrum. Finally, we ask whether the need for interoperability warrants the adoption of technical standards in this band.

In this Fifth Further Notice, we also request comment on a wide range of questions that will enable us to weigh the costs and benefits associated with all rule changes we will be considering. For this reason, we request that commenters provide specific data and information, such as actual or estimated dollar figures for each specific cost or benefit addressed, including a description of how the data or information was calculated or obtained and any supporting documentation or other evidentiary support. All comments will be considered and given appropriate weight. Vague or unsupported assertions regarding costs or benefits generally can be expected to receive less weight and be less persuasive than more specific and supported statements.

Coordination

As noted above, our rules currently require 4.9 GHz licensees to "cooperate in the selection and use of channels in order to reduce interference and make the most effective use of the authorized facilities." In the Further Notice, the Commission expressed concern that this rule "may not ensure that applicants for primary permanent fixed stations offer sufficient protection to other primary permanent fixed stations and other co-primary users," and that "additional measures are required to minimize the potential for interference." Accordingly, the Commission advanced a proposal for a notification and response coordination procedure used in part 101 of the Commission's rules. The Commission also invited commenters to suggest any alternative measures that would serve the purpose of the proposal. The comments identified two such alternatives: the registration and database creation approach, and the regional plan approach. We seek comment below on these alternatives.

Although quantifying the benefits of coordination to primary users and the added costs imposed on applicants may be difficult, we believe it is important to determine whether adopting

a coordination procedure will significantly benefit the public. This is due to the apparent benefits of coordination: (i) reduced risk of interference, which translates into clearer communications, which in turn may mean the difference of life or death in an emergency situation, and (ii) improved spectrum efficiency, which would allow more entities to use the 4.9 GHz band for wireless broadband communications. We therefore are seeking more information on the benefits and costs of implementing such a procedure. Specifically, are the Commission's concerns from the Further Notice as recounted above sufficiently valid to warrant a more formal coordination requirement? Is § 90.1209(b) sufficient as it is? Are there interference issues today that cannot be resolved by the requirements of this rule? How would the 4.9 GHz license environment look if the Commission does not alter 4.9 GHz coordination requirements? If commenters agree with the Commission's concerns, are there non-regulatory alternatives to new coordination procedures?

Part 101 approach

Background and prior comments. In the Further Notice, the Commission sought comment on a proposal to modify § 90.1209(b) to require applicants for primary fixed stations providing point-to-point and point-to-multipoint communications to complete the prior coordination procedures of § 101.103(d) of the Commission's rules. In response, the National Spectrum Management Association (NSMA) supported the approach as "allow[ing] a high degree of frequency reuse while avoiding harmful interference." It notes that "[m]any public safety organizations are licensees of fixed microwave spectrum under part 101 and we believe that these users have confidence in the value of the prior coordination process for these systems." NSMA recommends that coordination should be required for all permanent fixed systems, including secondary systems, for three reasons: site-by-site licensing is required for all fixed

stations; secondary systems are potential interference sources; and this interference is most appropriately addressed in the coordination process.

NPSTC, Harris, APCO and Motorola oppose the part 101 coordination method. These parties emphasize that part 101 links are highly directional and thus can be represented as narrow paths on a coordination map; in contrast, they note, the low-power, less-directional, geographically-dispersed links in a 4.9 GHz network must be represented as a service area or sector. NPSTC argues that § 101.103(d) requirements regarding "permissible levels" of interference and resolution of "technical problems" are difficult to apply in the 4.9 GHz context, where there are a large variety of operations and where system overlap is often impossible to avoid. It also notes that the § 101.103(d)(1) provision for attaching an explanation to the application in the event technical problems cannot be resolved includes no criteria to be applied to either accept or reject such an explanation. In reply comments, Motorola agrees that "requiring public safety agencies to coordinate and reply without standards to guide the engagement will lead to protracted and burdensome negotiations." Motorola states that "it would be difficult, if not impossible, to establish technical criteria for this band given the diversity of networks and devices that can be deployed in the 4.9 GHz band." Harris similarly notes that in this context part 101 coordination would "create confusion, be burdensome and would slow the deployment of broadband and data-sharing applications."

NSMA submitted reply comments to address these concerns about part 101 coordination. NSMA notes that part 101 coordination "takes place among the licensees" and does not require the involvement of FCC-certified frequency coordinators or regional planning committees. Moreover, NSMA states that "the interference criteria used are those deemed appropriate by the parties involved and may be based on good engineering practice as applicable to the band" and

that part 101 coordination "can be completed much more quickly [than 30 days] or even verbally if the parties agree." Finally, NSMA argues that when directional antennas are used to form point-to-point links, "methods of direct interference calculations [used in the part 101 context] could be used even if the antennas are lower in gain and larger in beamwidth."

Discussion. We acknowledge the views of the majority of commenters that part 101-type coordination procedures proposed in the Further Notice may not be appropriate for this band because they would add a level of uncertainty and complexity to the coordination process. For example, § 101.103(d)(1) requires applicants to select technical parameters "that will avoid interference in excess of permissible levels to other users." As NPSTC noted above, "permissible levels" of interference are not defined in the 4.9 GHz rules under part 90. Motorola also noted that requiring public safety agencies to coordinate without technical standards to guide the engagement could lead to protracted and burdensome negotiations, as incumbent licensees have no technical guidance on whether a proposed 4.9 GHz fixed link could cause interference to existing 4.9 GHz operations. We recognize that it would be difficult to establish technical criteria operations due to the diversity of networks and devices that can be deployed in the 4.9 GHz band. While we invite further comment on part 101-type coordination procedures for the 4.9 GHz band, we consider and invite comments on other coordination procedures below.

Registration and Database Approach

Comments. NPSTC and APCO assert that the Commission should provide for a registration procedure administered by the National Regional Planning Council (NRPC) in conjunction with individual public safety 700 MHz regional planning committees (RPCs). NPSTC states that "a NPSTC representative held informal discussions with the NRPC recently

and it appears that the NRPC, in conjunction with individual RPCs, is willing to assist with such a registration process." Motorola supports this NRPC/RPC registration proposal.

Discussion. Given the support of the majority of commenters and several participants in the 4.9 GHz Workshop, and the passage of time since the Commission adopted the majority of the 4.9 GHz service rules in 2003 and 2004, we seek further comment on the possibility of having the NRPC and/or RPCs administer registration in the 4.9 GHz band. We note that neither the NRPC nor any RPC filed comments or reply comments to the Further Notice, so we invite their input in particular. Commenters should explain whether and why the NRPC and/or RPCs are the most appropriate entities to administer this process, or if other entities would be better or equally qualified. We solicit views concerning each of the following areas described below: registration, database options, and coordination.

Registration. Under the NPSTC and APCO proposal, the registration process would populate a database with existing licensee technical parameter data so that a coordinating entity may select appropriate frequencies for new applicants. Based on our experiences, databases can provide a practical tool for certified frequency coordinators to perform their channel assignments if the appropriate information is included in the database. For example, the Universal Licensing System (ULS) does not contain receiver locations for point-to-point or point-to-multipoint links, base station coordinates, antenna gain, output power, and antenna height for facilities licensed on a geographic basis. Without this information, a coordinating entity would have great difficulty in protecting incumbent primary fixed links and base stations from interference from later-coordinated operations.

For this reason, we propose to require all current 4.9 GHz licensees to register the technical parameters of their permanent fixed point-to-point, point-to-multipoint and base-to-

mobile stations, including permanent fixed receivers when applicable, into a database. A database registration requirement would reduce the incidence of actual interference and would ensure that primary operations receive proper interference protection. In combination with existing license information available in ULS, this data would provide any coordinating entity with a detailed survey of the operating environment in a given geographic area. We solicit input on a comprehensive list of technical parameters that the database should store for each type of operation to facilitate successful coordination. A database administrator would first populate the database with data from ULS and then update the database on a regular basis. Subsequent registrations would supplement ULS data with additional data that is not currently in ULS, but would be needed in order to coordinate new applications. We envision that a coordinating entity, acting on behalf of an applicant, would use this database to select the most appropriate frequencies for new facilities. The database would need to be updated as licenses for new facilities are granted. We envision that this database would enable any coordinating entity to use the technical information in the database to coordinate new users while protecting incumbent licensees from interference. This framework would enable licensees with primary status to register the technical parameters of their facilities with the database administrator in order to ensure that their existing operations are protected from interference from new operations. We seek comment on all aspects of this proposal, including the entity best suited to operate the database. Are there any other benefits to a registration database requirement?

We seek comment on whether the lack of available information regarding existing 4.9 GHz fixed links is a problem that requires our attention. Specifically, we welcome views on whether the anticipated benefits of using some form of a registration database would outweigh the potential burdens imposed on licensees and applicants by the collection of the type of

information with such a database. The registration requirement would also impose information collection costs on licensees and applicants. With respect to burdens, what are the time and labor costs for licensees to register their data? Are licensees concerned about privacy and security regarding putting the details of their 4.9 GHz networks into a database? In considering the database options below, we ask commenters to consider the overall costs and benefits associated with each option.

Database options. To the extent that commenters support a mandatory database registration requirement, we seek comment on the most cost effective means to achieve that goal. We tentatively conclude that the most cost-effective option is for the Commission to create and maintain a 4.9 GHz registration database that is modeled after an existing registration database. We note, for example, that the Commission created a registration database as part of ULS for use on an interim basis in the millimeter wave 70/80/90 GHz bands. For purposes of populating the database for the 70/80/90 GHz bands, the Commission collected information such as coordinates of permanent fixed transmitters and receivers along with technical parameters and equipment information on FCC Form 601 Schedule M. We seek comment on the utility of this approach. Could the Commission use a similar approach to leverage its experience and staff expertise to create a new dedicated 4.9 GHz database, thus leading to lower initial development costs and ongoing operating costs? The 3650 MHz band has a similar database to 70/80/90 GHz, but it does not collect receiver information. We tentatively conclude that this model is not ideal because it is difficult to coordinate around primary permanent fixed point-to-point links if there is no receiver information.

We also seek comment on whether the Computer-Assisted Pre-Coordination Resource and Database (CAPRAD) would be more suitable to accommodate a database for coordinating

applications seeking to use the 4.9 GHz band. CAPRAD is an established, third-party database for the 700 and 800 MHz narrowband channels that RPCs use in advance of submitting regional plans to the FCC. Although RPCs widely use CAPRAD, we note that the Commission has never mandated its use. We note that RPCs are unfunded entities and may not be able to afford third party database access as part of their coordination duties. Accordingly, we seek comment on CAPRAD funding and administration for both development of 4.9 GHz capability and long-term continuity and maintenance of the database.

Finally, we solicit views about whether other parties would be in the best position to develop and administer a 4.9 GHz database. For example, in the White Spaces proceeding, the Office of Engineering and Technology designated nine commercial entities to serve as TV band device database administrators. Among other requirements, the entities had to demonstrate technical expertise, describe database function and architecture, and describe how devices would communicate with the database. If commenters support a new 4.9 GHz database developed and administered by third parties, we seek comment on its funding. Should the database administrator(s) charge coordinators for access, and what fee structure is reasonable?

Alternatively, we seek comment on whether the database paradigm developed in the TV White Spaces (TVWS) context itself could be extended to accommodate public safety use in the 4.9 GHz band. Could the TVWS databases be extended to include public safety registration information for this band? Could existing or newly authorized TVWS database administrators administer this additional functionality? Could such a system provide a platform, over time, to enable secondary commercial use of the band with database-enabled protections to public safety operations? We note that the TVWS database paradigm is vastly different from the other suggestions above because it could enable a dynamic, almost real-time environment where

different entities or different transmitters or links could be used at different times based on prior knowledge of activity in the band. Is such a dynamic database advantageous for the 4.9 GHz band? If so, then what is the feasibility for equipment manufacturers to provide geolocation capability to 4.9 GHz equipment and enable almost real-time flow of geolocation and 4.9 GHz band usage information between the equipment and a database? How would the database integrate existing operations that do not have these capabilities with new operations? What is the time frame for developing and deploying equipment? Finally, what are the cost implications on equipment and for coordination?

Coordination. We seek suggestions for appropriate coordination procedures. Should we mandate that 4.9 GHz applicants seek the concurrence of their RPC as a condition to Commission action on new applications and major modifications of existing facilities? What entities could provide coordination services on a continuing basis? How would 4.9 GHz coordination compare to the coordination process handled by certified frequency coordinators in the other public safety frequency bands? We seek comment on whether alternative entities, such as the certified public safety frequency coordinators, should handle coordination functions for the 4.9 GHz band. We also seek comment on what technical criteria should be used to ensure that new 4.9 GHz facilities protect existing users from interference. Should the technical criteria be codified in our rules or should it be an industry-agreed standard?

Applicability of coordination procedure. We note that the Further Notice proposal for a more formal coordination procedure was limited to primary fixed operations. We seek comment on whether we should require coordination for other uses, such as temporary fixed, mobile, and (as NSMA has urged) secondary permanent fixed uses. We also seek comment on whether all

possible uses should be subject to a coordination requirement, or whether certain uses should be exempt and be subject only to § 90.1209.

Inactive/unformed RPCs. We seek comment on registration requirements in regions with inactive or unformed RPCs. NPSTC states, "[o]ne concern that could arise with such a process is that a few of the 700 MHz RPC's are not yet active." In 2008, NPSTC found that "87% of the current [4.9 GHz] licenses do fall within active RPC areas," which would leave 13% of 4.9 GHz licensees without an RPC. We seek updated information on this question. In the event that individual RPCs administer registration, should registration in such areas default to the NRPC?

Costs and benefits. We seek comment on the costs and benefits associated with registration administered by the NRPC/RPCs. We ask commenters representing the NRPC or the RPCs to discuss to what extent they possess the personnel, technical, and financial resources to administer registration responsibilities for the 4.9 GHz band considering that these organizations are unfunded. Should the NRPC/RPCs be entitled to charge licensees a fee for registration? What is the likely or appropriate amount of such fees or other costs? We seek comment on whether the benefits associated with this proposal can be quantified and whether they outweigh the costs?

Regional plan approach, § 90.1211

Section 90.1211(a) of the Commission's rules specifies that each region may (but is not required to) submit a plan on guidelines to be used for sharing spectrum in the 4.9 GHz band. Paragraphs (b) and (c) of § 90.1211 contain elements to be included in regional plans and instructions for their modification, respectively. In 2004, the Commission reaffirmed its decision in the 4.9 GHz Third Report and Order not to make regional planning mandatory in the 4.9 GHz band.

Harris notes that § 90.1211 already specifies a process for ensuring coordination of 4.9 GHz links and proposes that it be amended so that the Regional Plans also cover permanent fixed links, as well as mobile and temporary fixed links. Harris asserts that having a single entity manage coordination in each region is appropriate because public safety 4.9 GHz networks can use the same infrastructure for fixed and nomadic links," and that such an approach "would better implement the Commission's intended licensing based on the geographic jurisdiction of licensees. In its view, "[t]he RPCs would be aware of operational links within a defined area on a map of a jurisdiction in which a licensee uses a specific channel and can provide 'coverage sectors' or 'frequency coverage' where a network is deployed on that frequency." Harris does not mention the NRPC, and thus appears to endorse a regional as opposed to a national approach. Nor does it mention a registration database.

Under the Harris approach, we ask whether RPCs could manage coordination in each region by submitting regional plans to the Commission rather than having licensees register technical parameters in a database. How would RPCs be able to coordinate new applicants successfully around incumbent operations without a comprehensive database?

In 2004, the Commission stayed the 2004 deadline for submitting regional plans. Because the stay is still in effect, we seek comment on whether we should lift the stay in this proceeding and pursue Harris' recommendation. What would be the appropriate deadline for RPCs to submit plans on guidelines to be used for sharing the 4.9 GHz spectrum within the relevant region? Would twelve months after the lifting of this stay allow sufficient time? For commenters that support lifting the stay, should we modify the rule and now mandate that all active RPCs submit plans on guidelines to be used for sharing the 4.9 GHz spectrum within the relevant region? Should we require periodic updates to the plans to account for evolution in use

of the band, and if so what period would be appropriate? Should we amend § 90.1211(b) so that regional plans include descriptions of permanent fixed links, as Harris suggests, and also base stations? What other modifications to the rule would be necessary? For commenters that support a continued stay, would subsections (b) and (c), which detail minimum common elements for all plans and modification procedures, continue to serve any purpose? If not, should we delete those rules altogether, and why? Finally, are the national registration database approach and the regional plan approach mutually exclusive? If not, how could certain elements of each approach be combined to serve the public interest?

Expanded Eligibility and Alternate Licensing

We also take this opportunity to explore additional ways in which we could promote efficient and increased use of the 4.9 GHz band. One approach is to expand eligibility to include certain non-public safety entities. Three other approaches – all suggested by participants at the 4.9 GHz Workshop – are to implement usage-specific licensing, to substitute jurisdictional licensing for individual entity licensing, and to allow all permanent fixed point-to-point operations on a primary basis regardless of whether they support broadband or narrowband traffic. These approaches are not necessarily mutually exclusive, so we seek comment on various combinations of these approaches in addition to responses to the more specific questions we ask below.

Expanded eligibility. Currently, only entities providing public safety services are eligible for licenses in the 4.9 GHz band. Non-public safety entities may use the 4.9 GHz spectrum by entering into sharing agreements with eligible 4.9 GHz public safety licensees, but only for "operations in support of public safety." We invite parties that have entered into such agreements to file comments describing their arrangements and how they are using 4.9 GHz

spectrum. We seek comment on whether the Commission should extend eligibility to use the band to non-public safety users, subject to protections to maintain the integrity of public safety operations. While we believe that all primary uses of the 4.9 GHz band should remain limited to operations in support of public safety consistent with § 90.1203(b), we tentatively conclude that expanding eligibility for commercial use on a secondary basis would benefit and reduce regulatory burdens on non-public safety entities by removing a barrier to entry to use the 4.9 GHz band. In particular, we note the spectral proximity of the 4.9 GHz band to the 5 GHz band widely used by unlicensed Wi-Fi networks. We seek comment on whether expanding eligibility might improve the availability, variety, and economics of equipment that uses the band, to the benefit of public safety operations. Should the Commission open eligibility to commercial users on a secondary or other non-interfering basis subject to a shutdown feature to enable priority access by public safety entities? Commenters in support of commercial use should provide functional details on how such a shutdown feature would operate in practice. Could such a mechanism be based upon dynamic access control using a database similar to the TV White Spaces database? We seek comment on whether critical infrastructure industry (CII) entities, including utility companies, should be eligible to hold 4.9 GHz licenses on a primary basis, thus removing the requirement for a sharing agreement. How would allowing CII to be licensed affect the coordination schemes discussed above? Should the Commission extend eligibility to government entities that provide non-public safety services? Of what relevance here is the Spectrum Act's expanded definition of public safety entities to include emergency response providers? We seek comment on what other benefits might arise by relaxing use of the band. What are the costs for expanding eligibility, if any, including spectrum congestion?

Usage-specific licensing. Currently, all classes of operations in the 4.9 GHz band, such as base, mobile, and fixed operations, are able to co-exist on one license. Station class codes differentiate the various classes. One participant from the 4.9 GHz Workshop recommended that the Commission implement different types of licenses based on usage. For example, under this recommendation, an eligible user would operate permanent fixed links under one license with a distinct radio service code, while the same user would conduct its mobile-only operations under a separate license with a different radio service code. Usage-specific licenses may facilitate coordination, especially if the Commission decides not to implement a registration database as part of ULS. We seek comment on the merits of usage-specific licensing. For example, interested parties would be able to see licenses for base/mobile operations, point-to-point, and mobile-only, and plan new operations around the incumbents accordingly. Would usage-specific radio service codes be duplicative of the current system of station class codes for different uses on a single license? Would usage-specific license types have a direct impact on accommodating new technology or encouraging development in the band? Would licensees view usage-specific license types as restrictive or flexible, and why? If commenters support usage-specific licensing, then we also seek comment on whether new or existing radio service codes are the better method to implement usage-specific license types. We also seek comment on the benefits and costs of implementing distinct licensing. Would licensees need to modify their licenses or possibly apply for new licenses to separate different uses that are currently authorized under one license?

Jurisdictional licensing. Another participant from the 4.9 GHz Workshop recommended that the Commission require single jurisdictional licensing, as opposed to individual licenses for each agency within a jurisdiction. For example, a town's fire, emergency medical services, and police departments would operate under one town 4.9 GHz license, as opposed to separate

licenses. We seek comment on this recommendation. Would single jurisdictional licensing help eligible users effectively utilize the spectrum and encourage different users to coordinate their operations amongst each other? Would this approach, by reducing the number of licenses, substantially simplify RPC coordination? In the event that the Commission expands primary eligibility to CII entities as described above, should CII and traditional public safety entities in the same jurisdiction, such as a power utility company and a fire department, be forced to share a 4.9 GHz license without the safeguard of priority use in favor of the public safety entities in times of emergency, or should a private agreement govern use of the license? We seek comment on the benefits and costs associated with jurisdictional licensing. What other benefits would accrue from jurisdictional licensing? What time and costs would be required for individual users within a jurisdiction to coordinate their operations amongst each other? How would the Commission enforce licensee responsibilities for arrangements involving related or unrelated entities operating in the same jurisdiction?

Primary permanent fixed links. Prior to 2009, the Commission licensed all permanent fixed stations on a secondary basis to other operations in the 4.9 GHz band. In 2009, the Commission amended § 90.1207(d) to permit licensing of permanent fixed point-to-point and point-to-multipoint stations that deliver broadband services on a primary basis, while those stations that deliver narrowband traffic remain secondary. One participant from the 4.9 GHz Workshop recommended that the Commission promote use of the band by allowing all permanent fixed point-to-point operations on a primary basis, regardless of whether they support broadband or narrowband traffic. We seek comment on this proposal. We seek comment on whether such action may result in prolonged interference disputes or increased coordination challenges. Because the recommendation applies only to permanent fixed point-to-point stations,

we also seek comment on whether permanent fixed point-to-multipoint stations that do not deliver broadband service would remain secondary.

Complement to 700 MHz Broadband Networks

As noted above, in the Fourth FNPRM, we recognized the need for broadband available for fixed uses in connection with the public safety broadband network, and invited comment on how the 4.9 GHz band could be used to complement the 700 MHz public safety broadband spectrum, which is allocated to mobile use. MSI and Harris filed comments relevant to this topic. As part of the Spectrum Act, Congress has now mandated the creation of FirstNet, which will be responsible for constructing and deploying a nationwide interoperable public safety broadband network. It has also authorized the Commission to "take any action necessary to assist [FirstNet] in effectuating its duties and responsibilities" under that Act. We seek comment on the use of the 4.9 GHz band for fixed, backhaul, and mobile uses in support of the 700 MHz band public safety broadband network, and whether such uses are appropriate or desirable. In general, we seek comment on what changes to the 4.9 GHz rules are necessary to better enable the 4.9 GHz band to complement the 700 MHz public safety broadband network. Finally, we seek comment on FirstNet's eligibility to hold licenses in the 4.9 GHz band.

Fixed uses. In response to the Fourth FNPRM, MSI suggests that "[t]he 4.9 GHz band could be used to supplement the 700 MHz public safety mobile broadband spectrum particularly for offloading video." Since the 4.9 GHz band has a fixed service allocation, we believe the 4.9 GHz band is ideal for video fixed uses, such as point-to-point video surveillance links. We seek further comment on whether and how fixed links in the 4.9 GHz band could complement the 700 MHz broadband public safety network. What other dual-band applications do commenters envision? How can fixed links be used during day-to-day operations as well as during

emergencies or disasters? Are there applications, system configurations, or geographic morphologies that are best suited for fixed use in the 4.9 GHz band? What changes to the 4.9 GHz rules, if any, are necessary to enable fixed links in the 4.9 GHz band to complement the 700 MHz public safety broadband network? We ask commenters supporting rule changes to discuss how such rule changes would serve the public interest. We also request comment on the relative costs and benefits of using 4.9 GHz technology to complement the 700 MHz public safety broadband network as compared to other technologies, such as point-to-point microwave interconnection in other bands and fiber optic interconnection.

Backhaul and coordination/licensing. We seek comment on how the 4.9 GHz band can assist public safety communications with their backhaul needs? Harris states, "[t]he 4.9 GHz band could be a vital resource to public safety in providing 700 MHz backhaul services." Harris suggests, "[r]ules that allow 4.9 GHz networks to compliment [sic] 700 MHz networks will maximize the capabilities and capacity of both bands." We seek comment on what specific rules could allow 4.9 GHz networks to complement 700 MHz networks? Next, MSI suggests that the Commission could "mandate the use of 4.9 GHz for public safety backhaul instead of 6-38 GHz." We seek comment on this proposal; however, we are concerned about restricting flexibility and choice. If the 4.9 GHz band is used for both backhaul and fixed broadband to complement 700 MHz, how will coordination be affected? Would 4.9 GHz fixed links and backhaul links have similar technical parameters in terms such as antenna gain, power, and path? If so, would the two types of traffic be treated the same from a coordination standpoint? Should 4.9 GHz components that interconnect with the 700 MHz public safety broadband network be treated different than other 4.9 GHz components from a coordination standpoint? Related to our licensing questions above, we seek comment on whether a new type of license should be issued

for 4.9 GHz operations that interconnect with the 700 MHz public safety broadband network. What changes to the 4.9 GHz coordination and licensing rules, if any, are necessary to enable backhaul use in the 4.9 GHz band to complement the 700 MHz public safety broadband network, and how would these changes serve the public interest?

FirstNet eligibility. We seek comment on whether FirstNet – the statutorily designated licensee of the national public safety broadband network operating in the 700 MHz band – is or should be eligible for a 4.9 GHz band license. The Spectrum Act requires FirstNet's network to include a core network that, inter alia, provides "connectivity between . . . the radio access network; and . . . the public Internet or the public switched network, or both." This function is commonly referred to as "backhaul." As we discussed above, the 4.9 GHz band could support backhaul links for the Public Safety Broadband Network.

As noted above, our rules currently limit eligibility for licensing in the 4.9 GHz band to "[e]ntities providing public safety services as defined under § 90.523." Section 90.523 in turn incorporates the definition of public safety services used in section 337(f)(1) of the Communications Act, which refers for purposes of allocations in the 700 MHz band to services

the sole or principal purpose of which is to protect the safety of life, health, or property;

that are provided by State or local government entities; or by nongovernmental organizations that are authorized by a governmental entity whose primary mission is the provision of such services; and that are not made commercially available to the public by the provider.

FirstNet is an "an independent authority within the NTIA," a Federal entity. It is not a state or local government entity, nor is it a nongovernmental organization that is authorized by a governmental entity whose primary mission is the provision of public safety services. FirstNet thus does not appear to qualify for 4.9 GHz licenses under the current definition. On the other

hand, our rules do permit 4.9 GHz licensees to enter into sharing agreements with or other arrangements with entities that do not meet these eligibility requirements. Is the rule permitting these sharing agreements sufficient to allow FirstNet to take advantage of the opportunities the 4.9 GHz band has to offer? Or, should we amend our rules to establish FirstNet's eligibility? If so, should its eligibility be restricted to applications in support of the national public safety broadband network, such as backhaul? Of what relevance to these questions is the relationship of FirstNet under the Spectrum Act to State government entities that participate in the deployment of FirstNet or in the statutory "opt out" process, or to secondary users of the 700 MHz public safety broadband network providing non-public safety services?

Channel Plan Adjustments

In 2003, the Commission adopted a frequency utilization plan that it determined "will be beneficial from an operational perspective, and will not unduly restrict the flexibility of 4.9 GHz band licensees and users." The Commission created a plan that "consist[s] of ten one-megahertz channels and eight five-megahertz channels that can be combined to a maximum of twenty megahertz, which provides users with maximum flexibility to employ existing technologies, while leaving the door open for the implementation of future broadband technologies in the band." We seek comment on how well the channel plan has served the Commission's goals. Moreover, we encourage interested parties to comment on the relative costs and benefits of the following specific approaches to modifying that plan, and how they might promote more efficient use of the band.

Channel aggregations. We seek comment on whether more flexible channel aggregations are necessary to accommodate new technology. We note that § 90.1213 already affords some bandwidth flexibility by permitting aggregated channel bandwidths of 5, 10, 15, or 20 MHz.

What other aggregations should the Commission allow? Do licensees have throughput requirements that necessitate channel aggregations greater than 20 MHz? We also seek comment on the individual channels. Do users find inefficiencies with the channel bandwidths for certain applications? Should the Commission revise the channel plan to specify different channel bandwidths other than 1 and 5 MHz? Interested parties should propose specific band plan alternatives along with appropriate justification. What are the costs associated with channel plan adjustment? What would manufacturers spend to design and produce equipment that could conform to a channel plan adjustment?

Narrow channels. Next, we address the ten 1-MHz bandwidth channels at the edges of the 4.9 GHz band. These narrow channels can support low-bandwidth applications, such as slow scan video surveillance and backhaul of narrowband voice traffic. Accordingly, we seek comment on a proposal to designate some or all of the 1-MHz bandwidth channels for non-broadband (*i.e.*, narrowband) use on a primary basis, and we ask whether such designation would promote use of the 4.9 GHz band. Would such designation be detrimental to broadband applications? What would be the costs associated with such designation? Are ten 1-MHz bandwidth channels sufficient, and if not, what quantity should the band plan provide? On the other hand, should the Commission reduce the number of 1-MHz bandwidth channels to provide more spectrum for broadband applications, notwithstanding that current rules allow users to aggregate the 1-MHz channels to form larger bandwidths? What effect would such a reduction have on potential interference into adjacent bands, particularly radio astronomy operations?

Usage-specific channels. Finally, we seek comment on designating certain channels in the band for specific uses, such as fixed point-to-point or mobile operations. MSI argues that mixed use of fixed and mobile services could introduce unacceptable interference, and that

dedicating a fixed portion of the band to point-to-point use and providing a reasonable coordination mechanism would help enable the use of 4.9 GHz spectrum for broadband backhaul. We invite interested parties to propose specific band plans that balance different uses, along with appropriate justification. Should applicants be required to demonstrate that other microwave bands or terrestrial interconnection facilities are not available for their proposed use as a condition for receiving a point-to-point backhaul authorization in the 4.9 GHz band? Should the use of the 4.9 GHz band for point-to-point backhaul links be limited to paths in excess of a given length, *e.g.,* greater than 16 km? Alternatively, rather than designating certain channels in the band for specific uses by rule, should we leave such decisions up to the designated regional authority or coordinator for a given area based on the specific needs of that area? This would result in different channel uses in different areas, but it could provide maximum flexibility for spectrum users. If commenters support this scenario, how would users and coordinators manage potential interference at regional boundaries?

Other Issues

In this section, we consider the merits of power limit changes, antenna gain, polarization restrictions, aeronautical mobile use, standards changes, emission masks, and the implementation of deployment reporting requirements.

Power and Polarization Restrictions

Comments. As noted above, some commenters to the Further Notice observed that 4.9 GHz fixed links have a relatively wide beam that is less directional than a typical microwave link. Wide beamwidths for point-to-point links translate to inefficient use of the 4.9 GHz band because they cover a larger sector when only a narrow path is needed to reach a single receiver. Links with narrower beams could be coordinated closer together without risk of interference,

resulting in more efficient use of spectrum. Harris argues that "4.9 GHz fixed links can not be deployed with antenna above 26dB gain, and thus will not have a smaller beamwidth than ~ 8-10 degrees." By contrast, commenters note that microwave links have a minimum antenna gain that is higher than the maximum antenna gain for 4.9 GHz fixed links, and thus the beamwidth is only a few degrees, resulting in narrow, highly directional paths. In response to the Fourth FNPRM, NPSTC suggest that "one way [to make use of the 4.9 GHz band more efficient] is to specify a maximum ERP [effective radiated power] and a larger antenna gain thus reducing beam width." The 4.9 GHz rules do not contain ERP limits but, rather, maximum conducted output power and peak power spectral density limits.

ERP and antenna gain. We seek recommendations for an ERP limit for high power, permanent and temporary fixed transmitters. NPSTC also suggests exploring use of better coordination and larger antennas to make more efficient use of the 4.9 GHz band for broadband backhaul. Accordingly, we seek comment on whether we should specify a minimum antenna gain for high power, permanent and temporary fixed operations, thereby to minimize beamwidth and the potential for interference. Section 90.1215 provides a maximum directional antenna gain for point-to-point and point-to-multipoint operations of up to 26 dBi with no corresponding reduction in maximum conducted output power or spectral density output power. If antennas with a gain of more than 26 dBi are used, ERP must be reduced proportionately. The Commission imposed the 26 dBi antenna gain limit "in order to avoid interference from fixed operations to mobile operations." To make point-to-point use in the band more efficient, we seek comment on whether the Commission should establish a minimum gain for point-to-point transmitting antennas and, if so, what value of gain is appropriate and what power reduction, if any, should be required. We also seek comment on whether we should impose a maximum ERP

limitation on point-to-point links. We do not propose specific rule modifications at this time without a more substantial record. Interested commenters should provide technical analyses to support their recommendations on peak power and peak spectral density and/or antenna gain, bearing in mind the restriction imposed by § 90.205 of the Commission's rules: "applicants for licenses must request and use no more power than the actual power necessary for satisfactory operation." Should the Commission impose side lobe radiation limits on antennas used in point-to-point links? Commenters should note that any increase in the power limits for the 4.9 GHz band would also have to be reflected in our agreements with Mexico and Canada for this band. What are the costs associated with requiring larger, narrower beamwidth, antennas? Is there a practical limit to the size of antenna that may be employed? Is the gain in spectrum efficiency commensurate with the cost of larger antennas?

In addition, we seek comment on requiring point-to-point links to use a specific polarization, *e.g.*, horizontal or vertical, to reduce potential interference to other links or to portable or mobile devices. Applicants are required to specify the type of polarization proposed when they file 4.9 GHz applications. Should the Commission specify the polarization to be used in devices other than point-to-point links? What are the costs to retrofit or replace an antenna to change its polarization? Would polarization diversity increase the number of links that could be placed in a given area, thus increasing throughput? What benefits would this higher throughput provide? Are there other polarizations, *e.g.*, angular, elliptical or circular, that would increase the number of links that could be placed in a given area or reduce potential interference?

Aeronautical Mobile Use

Background. Sections 2.106 and 90.1205(c) prohibit aeronautical mobile operations in the 4940-4990 MHz band. In 2003, the Commission concluded that it could not fashion a

general rule to permit aeronautical mobile operation that would adequately protect radio astronomy from interference in all scenarios. However, the Commission concurrently established a policy to consider requests for aeronautical mobile operations on a case-by-case basis under the waiver process based upon a sufficient technical showing that the proposed operations would not interfere with in-band and adjacent band radio astronomy operations. The Commission has granted roughly a dozen waivers of § 90.1205(c).

Discussion. Given the interest in aeronautical mobile use of the band, we seek comment about whether to lift the general prohibition and allow licensees to bypass the waiver process, while maintaining an appropriate level of application review. We propose to revise § 90.1205(c) so that the rule permits aeronautical mobile operation in the band on a secondary, non-interference basis to 4.9 GHz terrestrial services and subject to certain conditions and requirements. The revised rule would require an applicant to provide a description of proposed operation to demonstrate that aeronautical mobile operations protect radio astronomy operations and 4.9 GHz terrestrial services from interference as a part of its application. The revised rule would also require that the applicant certify to the Commission that it has served a copy of the application to all listed radio astronomy observatories whose boundaries fall within a threshold distance from the edge of the aeronautical operation. We seek comment on whether these measures are sufficient to protect radio astronomy, or whether 4.9 GHz aeronautical mobile operation should be secondary to radio astronomy operations by rule. We seek comment on whether aeronautical mobile operation in the 4940-4990 MHz band poses an interference risk to fixed and mobile terrestrial services in the lower adjacent band 4800-4940 MHz and radio astronomy service in the band 4990-5000 MHz, and if so, we seek comment on whether a new rule is necessary to address this issue. We also propose to revise the allocation of the 4940-4990

MHz band in § 2.106, the Table of Frequency Allocations, to provide for aeronautical mobile service in addition to fixed and mobile services.

We therefore seek comment on what threshold distance for aeronautical mobile operations should apply, and whether a uniform distance is appropriate given the geographic diversity of the nation. The revised rule would note that the Commission will coordinate all such applications with the National Telecommunications and Information Administration. We seek comment on whether the rule should impose a maximum altitude of 1500 feet above ground, consistent with many of the waivers. We also seek comment on allowing only low power devices as defined by § 90.1215 for aeronautical mobile use. Moreover, we seek comment on whether the Commission should, on a case-by-case basis, impose special conditions and operating restrictions on individual licenses as necessary to reduce risk of interference to radio astronomy operations and 4.9 GHz terrestrial services. In addition, we propose to require that applicants submit their applications to their respective RPC or the NRPC for coordination. We seek comment on whether and how applications for airborne use should be coordinated differently from terrestrial uses. Applicants would also have to demonstrate that their aeronautical operations comply with our international agreements. For instance, 4.9 GHz transmitters may be operated in aircraft along the Mexico border provided certain signal strength limits at and beyond the border are satisfied.

While allowing aeronautical mobile use would be a permissive rule change rather than a restrictive one, we seek comment on the opportunity costs and benefits for licensees that seek to deploy aeronautical mobile operations. What are the costs and time requirements to provide a description of the proposed operation, to determine the distance to radio astronomy observatories, and to serve a copy of the application to affected observatories? What is the cost

for GPS lock or similar equipment designed to cease transmissions in the 4.9 GHz band if the aerial vehicle exceeds the maximum altitude or a certain maximum distance from the center point coordinates? How can aeronautical mobile use of the 4.9 GHz band benefit public safety?

Standards

In 2003 and again in 2004, the Commission declined to adopt technical standards that would provide interoperability in the 4.9 GHz band because: (1) the variety of services supported by the band did not readily lend themselves to standardization or interoperability, and (2) standards likely would have cemented the 4.9 GHz band in 2004 technology such that public safety would have been denied the benefits of emerging broadband technologies. We seek comment on whether these concerns are still valid today, and whether public safety's need for interoperability outweighs these concerns. We note that the Commission adopted the Long Term Evolution (LTE) standard as the common air interface for the 700 MHz public safety broadband network to ensure nationwide interoperability. In that instance, the Commission "depart[ed] from the Commission's traditional posture of technological neutrality" because "establishing a common air interface for 700 MHz public safety networks is necessary to achieve our critical goal of a nationwide interoperable public safety wireless broadband network." We share the goal of interoperability for the 4.9 GHz band. Does achieving this goal for the 4.9 GHz band require us to determine a standard for deployment in this band, or is a more flexible approach possible? According to a suggestion from the 4.9 GHz workshop, "developing open standards for equipment and infrastructure will allow interoperability and prohibit proprietary system deployments."

How should the FCC ensure that a competitive marketplace for equipment develops in the 4.9 GHz band? What safeguards can the FCC put in place and how should they be applied to

equipment that has already been deployed in the band? Next, because the 4.9 GHz band supports a variety of services, would it make sense to set multiple standards depending on the type of use rather than a single standard for all uses? Are most users of low power devices (output power under 20 dBm) gravitating toward a standard, such as IEEE 802.11, without a Commission mandate? Are users gravitating toward another standard for high power devices (output power higher than 20 dBm)? At present, is it possible to interconnect two or more 4.9 GHz networks for the purpose of responding to a multi-jurisdictional emergency? If not, how would standards make this possible? We seek comment on the costs and benefits for imposing equipment standards. What are the costs for equipment manufacturers to conform their designs to new standards, including costs associated with testing and FCC equipment certification? How would standards affect equipment costs for licensees over time? Because Wi-Fi equipment employs the IEEE 802.11 standard, how could economies of scale reduce equipment costs? Would standards benefit the public safety community by promoting interoperability?

What is the potential to adapt or redevelop equipment that is certified in nearby or adjacent frequency bands for use in the 4.9 GHz band? We note that in the band 4800-4940 MHz, the Table of Frequency Allocations lists fixed and mobile allocations for Federal users, similar to the allocations for 4.9 GHz for non-Federal users. Is any equipment from the 4800-4940 MHz band adaptable for the 4940-4990 MHz band? On the other hand, is it possible to adapt equipment certified for the 4.9 GHz band for other nearby bands? In either case, what are the steps and costs for such adaptations? We ask these questions to determine whether manufacturers may achieve economies of scale by developing multi-band equipment and thus pass on savings to end users.

Emission masks. In 2004, the Commission loosened emission masks on devices in the 4.9 GHz band so that low power devices are subject to the DSRC-A mask – identical to the IEEE 802.11a mask; and that high power devices are subject to the more restrictive DSRC-C mask. We seek comment on how well these emission masks are enabling public safety to leverage commercial-off-the-shelf (COTS) technologies in adjacent bands, such as the 5.4 GHz U-NII band and the ITS band. We seek comment on what other masks we should consider that would better enable 4.9 GHz users to leverage COTS equipment while reducing adjacent channel interference.

Deployment Reports

Consistent with our interest above regarding how licensees use the band and the importance of spectrum efficiency, we anticipate that it will be useful for the Commission to receive periodic updates from 4.9 GHz licensees on what spectrum uses and applications they are deploying, and the progress of those deployments. Progress reports will provide the Commission with more information about the kinds of operations licensees deploy and will enable it to make more informed decisions regarding the development of the 4.9 GHz band rules in the future. The deployment report would include information such as status of equipment development and purchase, including number of devices and users; site development, including use of existing towers; deployments and upgrades (commencement and completion), including site information and location; and applications in development or in use. We thus seek comment on whether to impose on 4.9 GHz licensees a periodic reporting requirement. What other specific information should the Commission collect in the report? Would it be appropriate to require such reporting on a quarterly basis for the first year following the license grant and on an annual basis thereafter? Should we subject such a requirement to a sunset provision? Should we also require

reporting on planning and funding? Because a deployment report would describe how a particular licensee is using the 4.9 GHz band, would a deployment reporting requirement be unnecessary with respect to usage-specific licenses? Does one obviate the other? We seek comment on the compliance burdens associated with proposed information collection, including the costs and time required for completion. Would a reporting requirement be beneficial to any party other than the Commission, and if so, how?

PROCEDURAL MATTERS

Ex Parte Presentations

This matter shall be treated as a "permit-but-disclose" proceeding in accordance with the Commission's ex parte rules. Persons making ex parte presentations must file a copy of any written presentation or a memorandum summarizing any oral presentation within two business days after the presentation (unless a different deadline applicable to the Sunshine period applies). Persons making oral ex parte presentations are reminded that memoranda summarizing the presentation must (1) list all persons attending or otherwise participating in the meeting at which the ex parte presentation was made, and (2) summarize all data presented and arguments made during the presentation. If the presentation consisted in whole or in part of the presentation of data or arguments already reflected in the presenter's written comments, memoranda or other filings in the proceeding, the presenter may provide citations to such data or arguments in his or her prior comments, memoranda, or other filings (specifying the relevant page and/or paragraph numbers where such data or arguments can be found) in lieu of summarizing them in the memorandum. Documents shown or given to Commission staff during ex parte meetings are deemed to be written ex parte presentations and must be filed consistent with § 1.1206(b). In proceedings governed by § 1.49(f) or for which the Commission has made available a method of

electronic filing, written ex parte presentations and memoranda summarizing oral ex parte presentations, and all attachments thereto, must be filed through the electronic comment filing system available for that proceeding, and must be filed in their native format (e.g., .doc, .xml, .ppt, searchable .pdf). Participants in this proceeding should familiarize themselves with the Commission's ex parte rules.

Regulatory Flexibility Analysis

As required by the Regulatory Flexibility Act of 1980, see 5 U.S.C. 603, the Commission has prepared a Final Regulatory Flexibility Analysis (FRFA) and Initial Regulatory Flexibility Analysis (IRFA) of the possible significant economic impact on small entities of the policies and rules addressed in this document. The FRFA is set forth in Appendix C and the IRFA is set forth in Appendix E of the Fourth Report and Order and Fifth Further Notice of Proposed Rulemaking. Written public comments are requested on the IRFA. These comments must be filed in accordance with the same filing deadlines as comments filed in response to this Fifth Further Notice of Proposed Rulemaking as set forth herein, and they should have a separate and distinct heading designating them as responses to the IRFA. The Commission's Consumer and Governmental Affairs Bureau, Reference Information Center, will send a copy of the Fourth Report and Order and Fifth Further Notice of Proposed Rulemaking, including this IRFA and FRFA, to the Chief Counsel for Advocacy of the Small Business Administration (SBA). See 5 U.S.C. 603(a).

Paperwork Reduction Act Analysis

This Fifth Further Notice of Proposed Rulemaking contains proposed new information collection requirements. The Commission, as part of its continuing effort to reduce paperwork burdens, invites the general public and the Office of Management and Budget (OMB) to

comment on the information collection requirements contained in this document, as required by the PRA. Public and agency comments are due **[INSERT DATE 60 DAYS AFTER PUBLICATION OF THIS DOCUMENT IN THE FEDERAL REGISTER]**. In addition, pursuant to the Small Business Paperwork Relief Act of 2002, Pub. L. 107-198, see 44 U.S.C. 3506(c)(4), we seek specific comment on how we might "further reduce the information collection burden for small business concerns with fewer than 25 employees." The Commission will submit the Fifth Further Notice of Proposed Rulemaking to the Office of Management and Budget for review under section 3507(d) of the PRA.

Congressional Review Act

The Commission will send a copy of the Fourth Report and Order and Fifth Further Notice of Proposed Rulemaking to Congress and the Government Accountability Office pursuant to the Congressional Review Act ("CRA"), see 5 U.S.C. 801(a)(1)(A).

ORDERING CLAUSES

Accordingly, WE ORDER, pursuant to sections 1, 4(i), 301, 302, 303, 316, and 403 of the Communications Act of 1934, 47 U.S.C. 151, 154(i), 301, 302, 303, 316, and 403, that this Fourth Report and Order and Fifth Further Notice of Proposed Rulemaking is HEREBY ADOPTED.

WE FURTHER ORDER that the Commission's Consumer and Governmental Affairs Bureau, Reference Center, SHALL SEND a copy of this Fourth Report and Order and Fifth Further Notice of Proposed Rulemaking, including the Final and Initial Regulatory Flexibility Analyses, to the Chief Counsel for Advocacy of the Small Business Administration.

List of Subjects in 47 CFR Parts 2 and 90

Communications equipment; Radio

FEDERAL COMMUNICATIONS COMMISSION

Marlene H. Dortch
Secretary.

For the reasons discussed in the preamble, the Federal Communications Commission proposes to amend 47 CFR parts 2 and 90 as follows:

PART 2 – FREQUENCY ALLOCATIONS AND RADIO TREATY MATTERS; GENERAL RULES AND REGULATIONS

1. The authority citation for part 2 continues to read as follows:

AUTHORITY: 47 U.S.C. 154, 302a, 303, and 336, unless otherwise noted.

2. Section 2.106, the Table of Frequency Allocations, is amended by revising page 40 to read as follows:

§ 2.106 Table of Frequency Allocations.

* * * * *

3300-3400 RADIOLOCATION 5.149 5.429 5.430	3300-3400 RADIOLOCATION Amateur Fixed Mobile 5.149	3300-3400 RADIOLOCATION Amateur 5.149 5.429	3300-3500 RADIOLOCATION US108 G2	3300-3500 Amateur Radiolocation US108	Private Land Mobile (90) Amateur Radio (97)
3400-3600 FIXED FIXED-SATELLITE (space-to-Earth) Mobile 5.430A Radiolocation 5.431	3400-3500 FIXED FIXED-SATELLITE (space-to-Earth) Amateur Mobile 5.431A Radiolocation 5.433 5.282	3400-3500 FIXED FIXED-SATELLITE (space-to-Earth) Amateur Mobile 5.432B Radiolocation 5.433 5.282 5.432 5.432A	US342	5.282 US342	
	3500-3700 FIXED FIXED-SATELLITE (space-to-Earth) MOBILE except aeronautical mobile Radiolocation 5.433	3500-3600 FIXED FIXED-SATELLITE (space-to-Earth) MOBILE except aeronautical mobile 5.433A Radiolocation 5.433	3500-3650 RADIOLOCATION G59 AERONAUTICAL RADIONAVIGATION (ground-based) G110	3500-3600 Radiolocation	Private Land Mobile (90)
3600-4200 FIXED FIXED-SATELLITE (space-to-Earth) Mobile		3600-3700 FIXED FIXED-SATELLITE (space-to-Earth) MOBILE except aeronautical mobile Radiolocation 5.433 5.435	US245	3600-3650 FIXED-SATELLITE (space-to-Earth) US245 Radiolocation	Satellite Communications (25) Private Land Mobile (90)
			3650-3700 US348 US349	3650-3700 FIXED FIXED-SATELLITE (space-to-Earth) NG169 NG185 MOBILE except aeronautical mobile US348 US349	
	3700-4200 FIXED FIXED-SATELLITE (space-to-Earth) MOBILE except aeronautical mobile		3700-4200	3700-4200 FIXED FIXED-SATELLITE (space-to-Earth) NG180	Satellite Communications (25) Fixed Microwave (101)
4200-4400 AERONAUTICAL RADIONAVIGATION 5.438 5.439 5.440			4200-4400 AERONAUTICAL RADIONAVIGATION 5.440 US261		Aviation (87)
4400-4500 FIXED MOBILE 5.440A			4400-4500 FIXED MOBILE	4400-4500	
4500-4800 FIXED FIXED-SATELLITE (space-to-Earth) 5.441 MOBILE 5.440A			4500-4800 FIXED MOBILE US245	4500-4800 FIXED-SATELLITE (space-to-Earth) 5.441 US245	
4800-4990 FIXED MOBILE 5.440A 5.442 Radio astronomy 5.149 5.339 5.443			4800-4940 FIXED MOBILE US203 US342	4800-4940 US203 US342	
			4940-4990 5.339 US342 US385 G122	4940-4990 FIXED MOBILE Aeronautical Mobile 5.339 US311 US342	Public Safety Land Mobile (90Y) Page 40

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PART 90 – PRIVATE LAND MOBILE RADIO SERVICES

3. The authority citation for part 90 continues to read as follows:

AUTHORITY: Sections 4(i), 11, 303(g), 303(r) and 332(c)(7) of the Communications Act of 1934, as amended, 47 U.S.C. 154(i), 161, 303(g), 303(r) and 332(c)(7).

4. Section 90.1203 is amended by revising paragraph (a) to read as follows:

§ 90.1203 Eligibility.

(a) The following groups of entities are eligible to hold a Commission license for systems operating in the 4940-4990 MHz band on a primary basis.

(1) Entities providing public safety services as defined under § 90.523. All of the requirements and conditions set forth in that section also govern authorizations in the 4940-4990 MHz band.

(2) Critical infrastructure industry (CII) entities as defined under § 90.7.

* * * * *

5. Section 90.1205 is amended by revising paragraph (c) to read as follows:

§ 90.1205 Permissible operations.

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(c) Aeronautical mobile operations are permitted on a secondary, non-interference basis to 4.9 GHz terrestrial services under the following restrictions. Altitude may not exceed 457 meters (1500 feet) above ground. Licensees may use only low power devices as defined by § 90.1215 for aeronautical mobile use. All applications for aeronautical operation require prior Commission approval. The applicant shall provide a description of proposed operation to demonstrate that the proposed aeronautical mobile operations protect radio astronomy operations

and 4.9 GHz terrestrial services from interference. Applicants shall submit their applications to their respective regional planning committee or the National Association of Regional Planning Committees for coordination. The applicant shall certify that it has served a copy of the application to all radio astronomy observatories listed in the Table of Frequency Allocations, § 2.106 footnote US311 of this chapter, whose geographic boundaries fall within [distance to be determined] kilometers of the edge of the proposed aeronautical operation. The Commission will coordinate all applications for aeronautical mobile operation with the National Telecommunications and Information Administration. The Commission has the discretion to impose special conditions and operating restrictions on individual licenses as necessary to reduce risk of interference to radio astronomy operations and 4.9 GHz terrestrial services.

6. Section 90.1209 is amended by revising paragraph (b) to read as follows:

§ 90.1209 Policies governing the use of the 4940-4990 MHz band.

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(b) Each application for a new frequency assignment or for a change in existing facilities as listed in § 1.929(c)(4) of this chapter must be submitted through the applicable regional planning committee (RPC) for coordination. In areas without active RPCs, all licensees shall cooperate in the selection and use of channels in order to reduce interference and make the most effective use of the authorized facilities. A database identifying the locations of registered stations will be available at *http://wireless.fcc.gov/uls*. RPCs and licensees should examine this database before seeking station authorization, and make every effort to ensure that their fixed and base stations operate at a location, and with technical parameters, that will minimize the potential to cause and receive interference. Point-to-point stations must employ either horizontal or vertical polarization; point-to-point unpolarized transmissions are prohibited. Licensees of

stations suffering or causing harmful interference are expected to cooperate and resolve this problem by mutually satisfactory arrangements. If licensees are unable to do so, the Commission may impose restrictions including specifying the transmitter power, antenna height, or area or hours of operation of the stations concerned. Further, the Commission may prohibit the use of any 4.9 GHz channel under a system license at a given geographical location when, in the judgment of the Commission, its use in that location is not in the public interest.

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7. Section 90.1213 is amended by revising the introductory text to read as follows:

§ 90.1213 Band plan.

The following channel center frequencies are permitted to be aggregated for channel bandwidths of 5, 10, 15 or 20 MHz as described in paragraph (b) of this section. Channel numbers 1 through 5 and 14 through 18 are 1 MHz bandwidth channels and channel numbers 6 through 13 are 5 MHz bandwidth channels. Channel numbers 1 through 5 and 14 through 18 are designated for narrow bandwidth operations and should be used in aggregations only if all other 5 MHz channels are blocked.

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8. Section 90.1219 is added to read as follows:

§ 90.1219 Deployment reporting.

(a) Licensees in the 4.9 GHz band shall file deployment reports with the Commission. Licensees may attach deployment reports to FCC Form 601. The report shall contain the following information:

(1) Status of equipment development and purchase, including number of devices and users;

(2) Site development, including use of existing towers;

(3) Deployments and upgrades (commencement and completion), including site information and location; and

(4) Applications in development or in use.

(b) During the first year following the initial grant or modification of a 4.9 GHz license, reports are due every three months after the grant date. After the first anniversary of the license grant, licensees must file deployment reports on an annual basis.

[FR Doc. 2012-18566 Filed 07/31/2012 at 8:45 am; Publication Date: 08/01/2012]